

Work Order ID 84677

May-30-12 3:48:45 PM

Duplicate

84677

Page 1

Item ID: D350-748-241TRN

Accept

N900040100

Setup

Start

NS1

Revision ID:

Item Name: Crosstube Turning Detail

Stop

NS2

Start Date: 17/05/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 22/05/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: MLJ

Date: 12/05/31 Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr								
----------	--------------	--	--	--	--	--	--	--	--

D350-748-241	F								
--------------	---	--	--	--	--	--	--	--	--

100		0.00							
-----	--	------	--	--	--	--	--	--	--

100	MORI SEIKI CNC LATHE LARGE								
--------------	----------------------------	--	--	--	--	--	--	--	--

Mori Seiki	Memo	0.00							
------------	-------------	------	--	--	--	--	--	--	--

Mori Seiki CNC Lathe Large	1-Fill tube with sand & install plugs on both ends as per Folio FA647								
----------------------------	---	--	--	--	--	--	--	--	--

2-Turn first side as per Folio FA647

3- File transition lines smooth.

FOLIO REV:

DWG REV: F

mm.l

12/07/11

110	QC1- Inspect dimensions to dimension sheet	0.00							
-----	--	------	--	--	--	--	--	--	--

110	Memo	0.00							
--------------	-------------	------	--	--	--	--	--	--	--

QC									
----	--	--	--	--	--	--	--	--	--

Quality Control									
-----------------	--	--	--	--	--	--	--	--	--

mm.l

12/07/11

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 84677

May-30-12 3:48:45 PM

84677

Page 2

Item ID: D350-748-241TRN

Accept

N900040100

Setup Start

NS1

Revision ID:

Item Name: Crosstube Turning Detail

Start Date: 17/05/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 22/05/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

120

120

Mori Seiki

Mori Seiki CNC Lathe Large

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

0.00

1 Ø 12-7-12

130

130

QC

Quality Control

QC1- Inspect dimensions to dimension sheet

0.00

1 Ø 12-7-12

140

140

QC

Quality Control

QC8- Inspect parts - second check

0.00

(DAS)
03
089

12-7-23

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 84677

May-30-12 3:48:45 PM

Item ID: D350-748-241TRN

Accept

84677

Revision ID:

Item Name: Crosstube Turning Detail

Start Date: 17/05/2012 Start Qty: 1.00 *1*

Required Date: 22/05/2012 Req'd Qty: 1.00 *1*

Reference:

Approvals: Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start *NR1*

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop *NR2*

Sequence ID/
Work Center ID

180

180

QC

Quality Control

Operation
Description

QC6- Inspect dimensions to drawing

Memo

Set Up/
Run Hours

0.00

(DAS
7/10/03)

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

190

190

Packaging

Packaging

Memo

0.00

JK

12-10-03

Packaging

Identify and stock in kanban rack
Location: _____

200

200

QC

Quality Control

QC21- Final Inspection - Work Order Release

0.00

Memo

0.00

MCG 12-09-28

MCG 12-09-28

W/O: 84677

WORK ORDER CHANGES

DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

12/8/08
12/8/08
12/8/08

Part No: D350-748-241TRU PAR #: _____ Fault Category: Rework NCR: Yes No DQA: ftn Date: 12/10/11
Resolution: _____ Disposition: X-tube QA: N/C Closed: IC Date: 12/10/11

WORK ORDER NON-CONFORMANCE (NCR)								
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
12/8/08	180	tubes are not straight and are not sandblasted. R.C. symbol	(DAS 16 S-03 05/2042 12/08/08)	Bend all Heat treat in Seal Before Bending	HN 12-8-28	JW 12-8-28	(DAS 16 S-03 05/2042 12/08/08)	(DAS 16 S-03 12/08/08)

NOTE: Date & initial all entries

Picklist Print

May 30-12 3:48:49 PM

Page 1

Work Order ID: 84677

Parent Item: D350-748-241TRN

Parent Item Name: Crosstube Turning Detail

84677***D350-748-241TRN***

Start Date: 17/05/2012

Required Date: 22/05/2012

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A New Issue 08-03-06 DD verified by:ec

IPP Rev B Removed polish 08.04.02 EC verified by : DD

IPP Rev C Removed LPS-3 08.06.23 Ec verified by: DD IPP Rev D

11.02.24 as per dwg rev.F DD verf: JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6015-125		Manufactured	No			120	Each	38.0000	1	1		**	

D6015-125

Crosstube Material

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
HALL	38	
61380	4	
72511	34	

1 mmml 12/07/06

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	84677
Description: Crosstube Assembly (AS350/355 High Aft)	Part Number:	D350-748-241
Inspection Dwg: D350-748-241 Rev: F		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+0.005/-0.000	2.244	✓	VERN	CNC-08
	2.180	+0.005/-0.000	2.184	✓		
	2.180	+0.005/-0.000	2.185	✓		
	2.208	+0.005/-0.000	2.213	✓		
	2.234	+0.005/-0.000	2.235	✓		
	2.253	+0.005/-0.000	2.256	✓		
	2.272	+0.005/-0.000	2.277	✓		
	2.299	+0.005/-0.000	2.304	✓		
	0.063	+/-0.010	.063	✓		
	4.26	+/-0.030			↓	↓
	R0.063	+/-0.010	.063	✓	R6	—
	R0.50	+/-0.030			R6	—
SIDE B	2.240	+0.005/-0.000	2.244	✓	VERN	CNC-08
	2.180	+0.005/-0.000	2.185	✓		
	2.180	+0.005/-0.000	2.185	✓		
	2.208	+0.005/-0.000	2.213	✓		
	2.234	+0.005/-0.000	2.236	✓		
	2.253	+0.005/-0.000	2.256	✓		
	2.272	+0.005/-0.000	2.277	✓		
	2.299	+0.005/-0.000	2.305	✓		
	0.063	+/-0.010	.063	✓		
	4.26	+/-0.030	4.26		↓	↓
	R0.063	+/-0.010	.063	✓	R6	—
	R0.50	+/-0.030	50	✓	R6	—
	122.70	+/-0.060	122.65	✓	TAPE	L6-22

Measured by:	<i>MML/KC</i>	Audited by:	<i>99</i>	Preliminary Approval:	
Date:	12/07/11	Date:	12-3-23	Date:	

Rev	Date	Change	Revised by	Approved
A	07.01.17	New Issue (P/O D350-748-201)	KJ/JLM	
B	12.02.02	Dwg Rev updated	KJ	<i>JK</i>

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

Item	Qty	Part Number	Description
1	X	D350-748-241	CROSSTUBE ASSEMBLY (AS 350/355 HI AFT)
2	1	D6015-125	CROSSTUBE (OR D6018-125)
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

F 1) MATERIAL: MANUFACTURED FROM D6015-125 OR D6018-125
FINISHED LENGTH = 122.700±0.06

2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2

3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.

4) UNITS: INCHES UNLESS OTHERWISE NOTED.

5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX

6) IDENTIFICATION: DART PART NUMBER "D350-748-241" AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)

7) WEIGHT: 29.85 lbs

8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.

9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT ALL EDGES FROM MACHINING
LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER
BENDING.

10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D.

11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING. ACCEPTABLE TO
VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.

12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE,
CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.

13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES,
NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY.
CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE
MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO
CRACKING/CHIPPING/GROOVES.

14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT
NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

15) MAX TWIST AFTER BENDING: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN
CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.25 (ZN C1-3).

SHOP COPY
RETURN TO
ENGINEERING

UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE

WORK ORDER

NO. *64637 MLJ*
12/05/13

RELEASED
2011-01-08
NP

F	ADD HRC TEST OPTION (B8-1) PER PAR 09-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIN NOW MACHINED (D1-4)	CP	10.11.23
E	REVISE GENERAL NOTES; UPDATE TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A8-3); ADD TOLERANCES (ZN C6-3, D2-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6018-125 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>PP</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	<i>PP</i>	DRAWING NO.	REV. F
CHECKED	<i>PP</i>	D350-748-241	SHEET 1 OF 4
MFG. APPR.	<i>PP</i>	APPROVED	SCALE
DE APPR.	<i>PP</i>	TITLE	NTS
DATE	10.11.23	CROSSTUBE (AS 350/355 HI AFT)	
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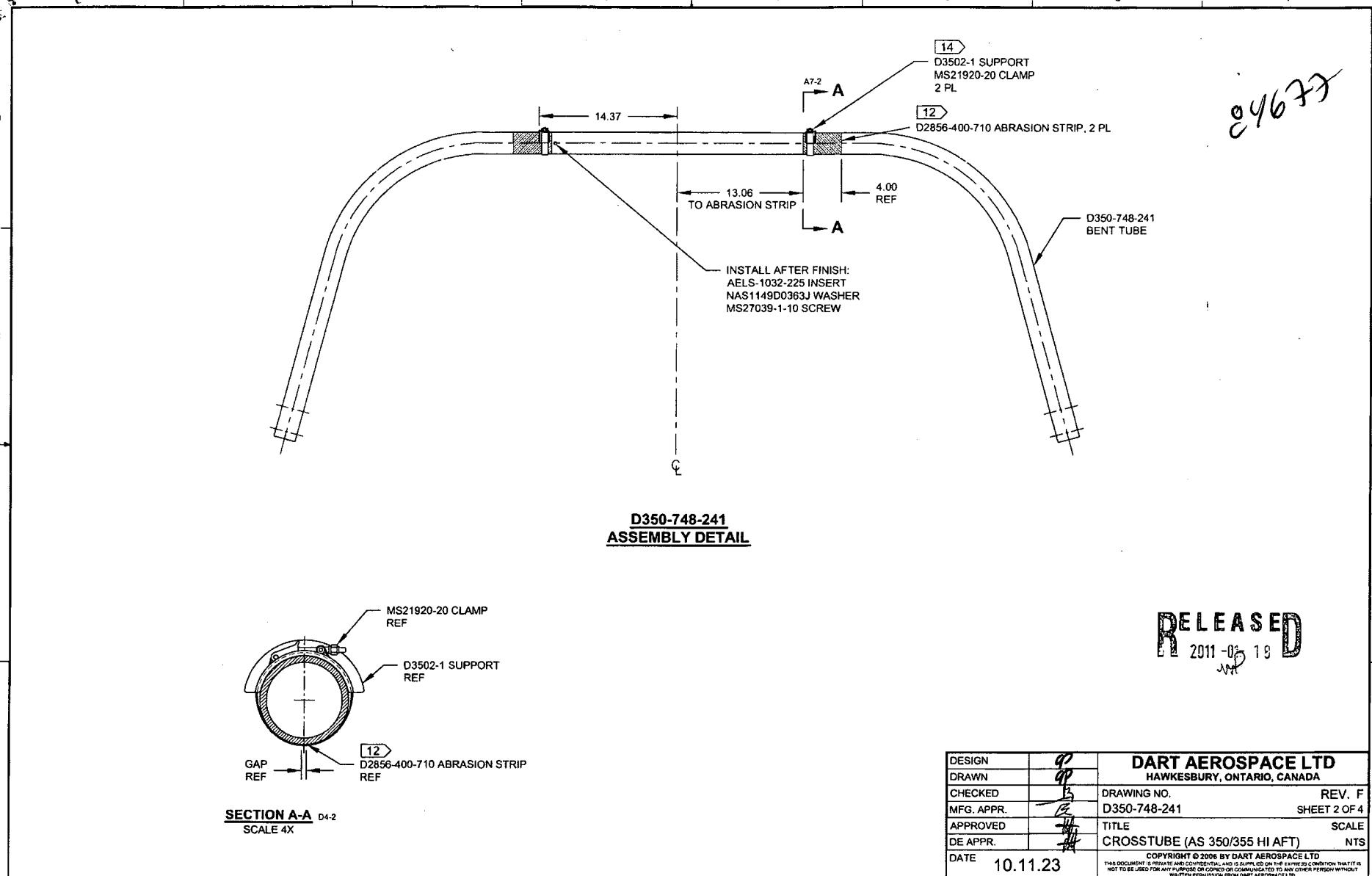
W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



DESIGN	9	DART AEROSPACE LTD
DRAWN	99	HAWKESBURY, ONTARIO, CANADA
CHECKED	12	DRAWING NO. REV. F
MFG. APPR.	12	D350-748-241 SHEET 2 OF 4
APPROVED	11	TITLE SCALE
DE APPR.	11	CROSSTUBE (AS 350/355 HI AFT) NTS
DATE	10.11.23	

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8 7 6 5 4 3 2 1

D C B A

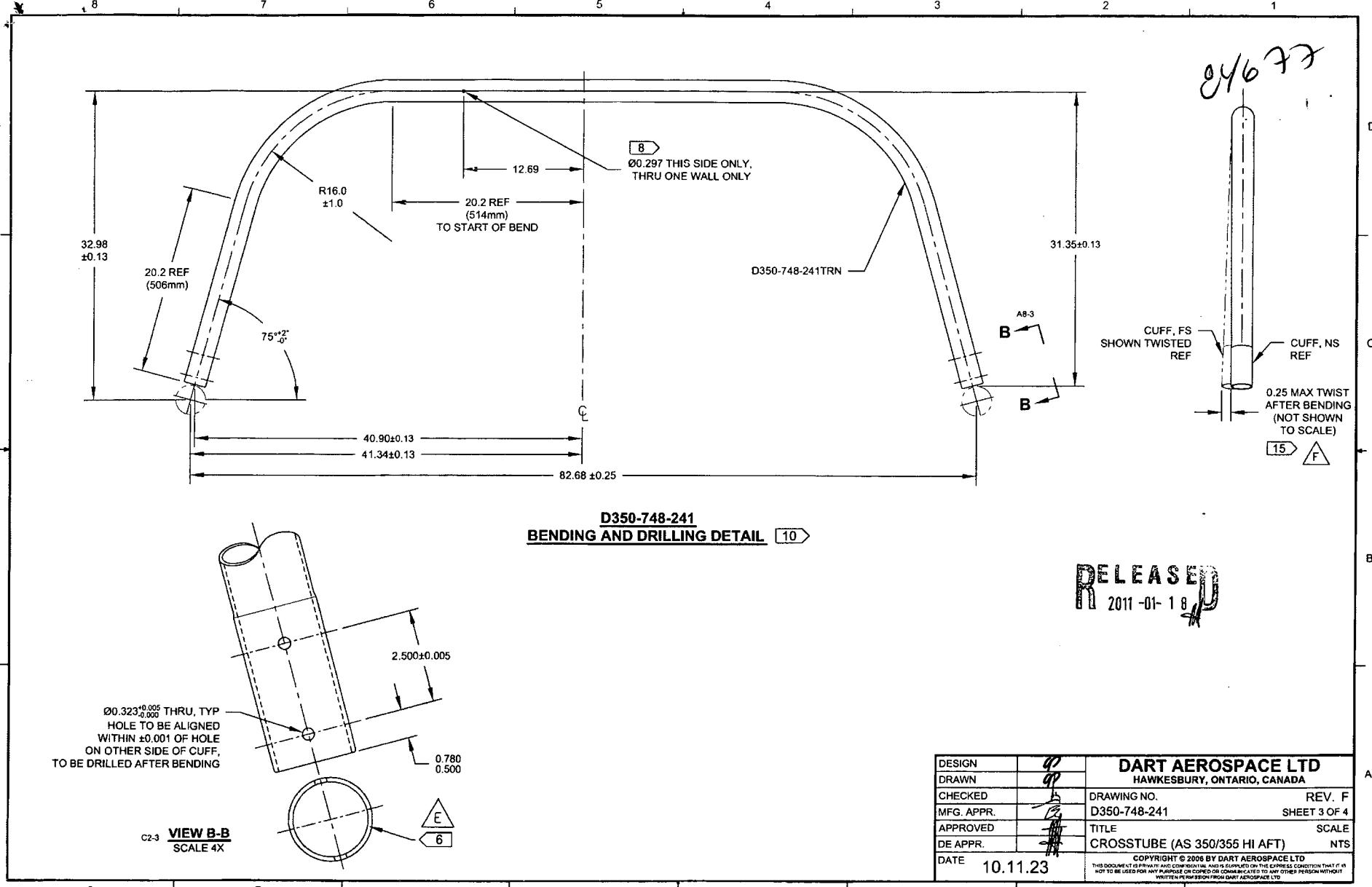
W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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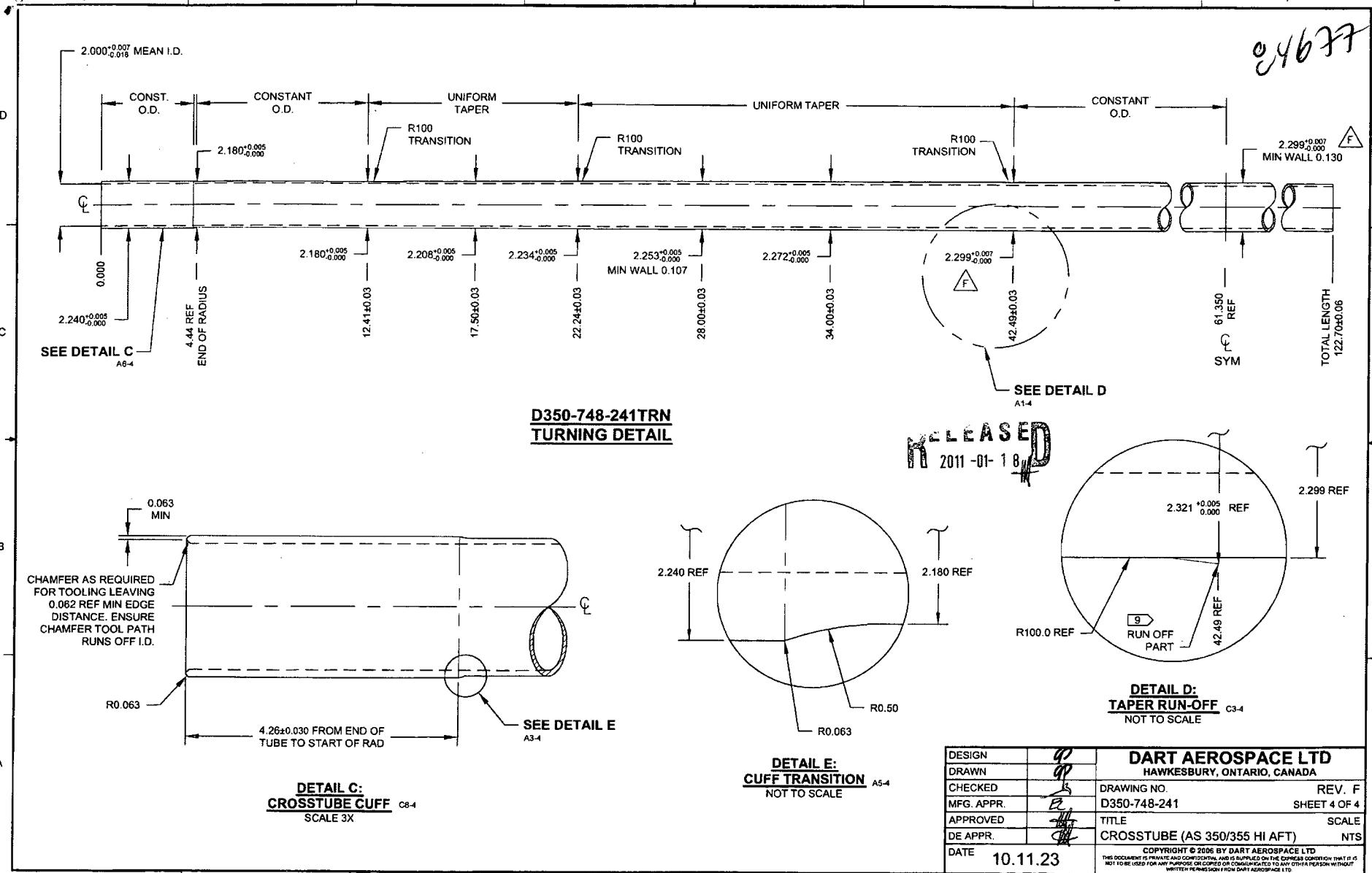
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DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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DESIGN	99	DART AEROSPACE LTD
DRAWN	gp	HAWKSLEY, ONTARIO, CANADA
CHECKED	8	DRAWING NO.
MFG. APPR.	PZ	D350-748-241
APPROVED	BB	REV. F
DE APPR.	BB	SHEET 4 OF 4
DATE	10.11.23	SCALE
		CROSSTUBE (AS 350/355 HI AFT) NTS

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Resolution: _____ Disposition: _____ QA: NC Closed: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD

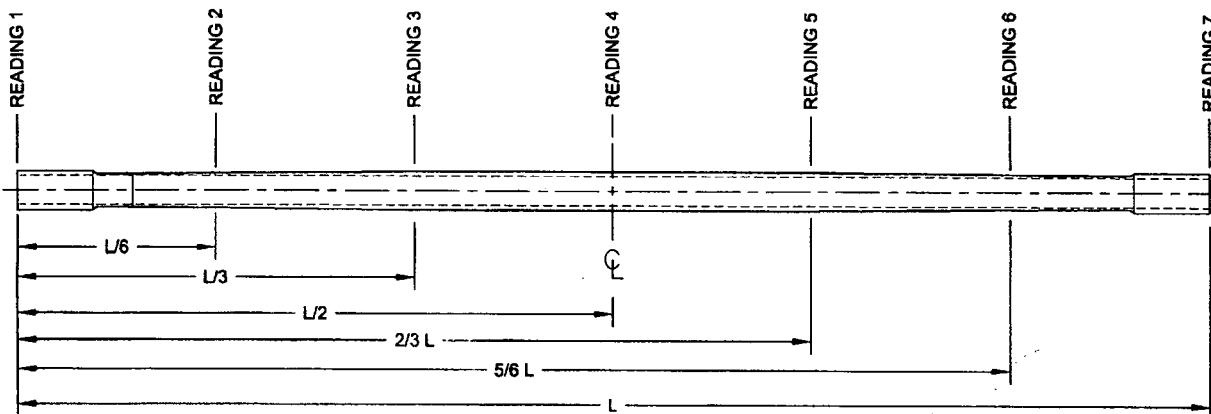
Work Order: EY6 72

Description: Crosstube Assembly (AS350/355 High Aft)

Part Number: D350-748-241

Inspection Dwg: D350-748-241 Rev: F

Page 2 of 2

WALL THICKNESS MEASUREMENT

Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0" 20.50	.124	.118	.124	.130	.012	
READING 2 L= 4.1205	.137	.130	.107	.111	.030	
READING 3 L= 6.1541	.173	.165	.144	.154	.029	
READING 4 L= 6.15	.159	.157	.162	.165	.008	0.030"
READING 5 L= 8.1	.160	.153	.157	.167	.007	
READING 6 L= 10.25	.123	.109	.118	.137	.028	
READING 7 L= 12.7	.127	.120	.128	.135	.015	

Calibration Result

Actual Block Thickness: 100-200

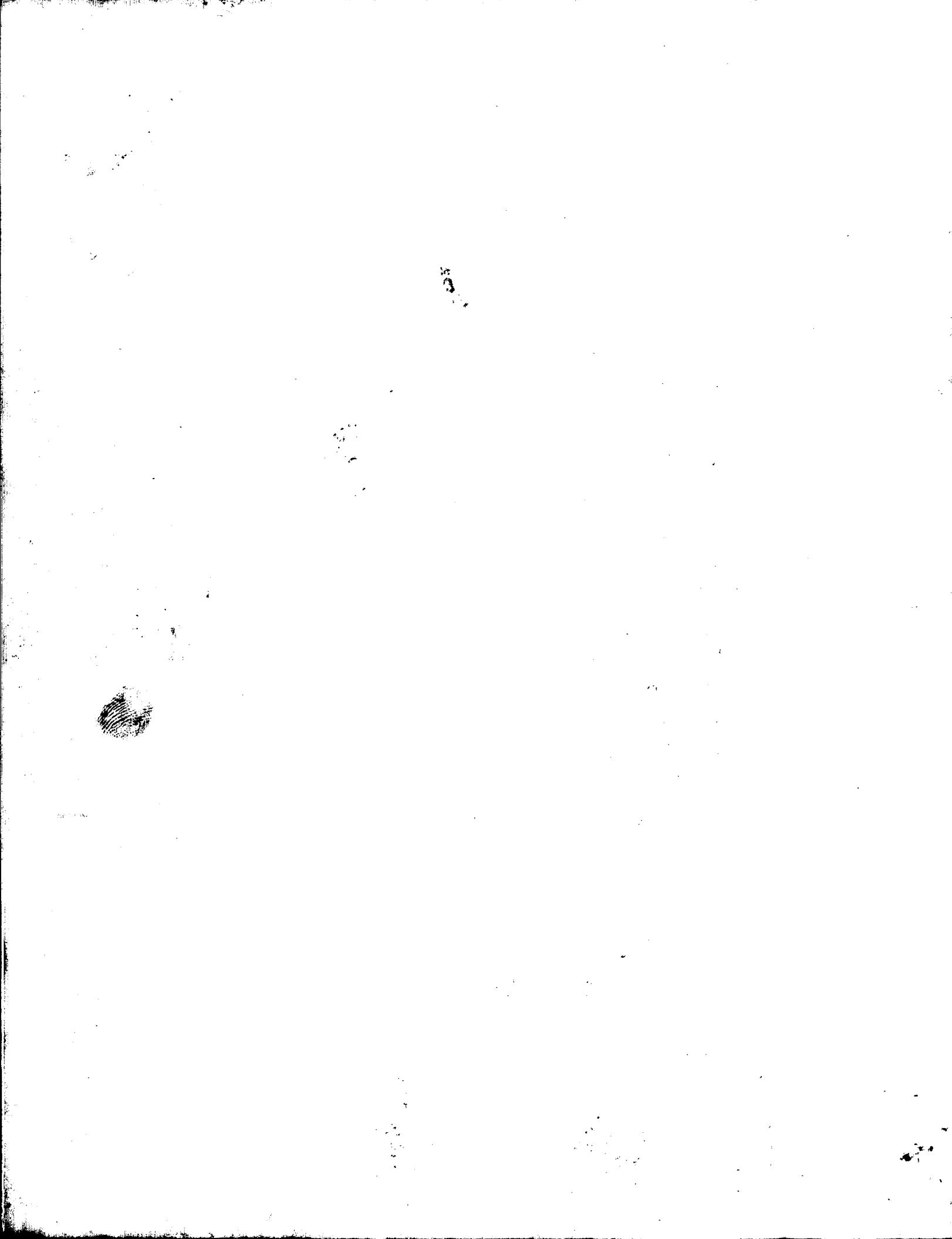
Sitescan 250 Measured Thickness: 100-200

Measured by:	KC
Date:	12-7-12

Audited by:	
Date:	12-7-23

Preliminary Approval:	
Date:	

Rev	Date	Change	Revised by	Approved
A	07.01.17	New Issue (P/O D350-748-201)	KJ/JLM	
B	12.02.02	Dwg Rev updated	KJ	
C	12.06.04	Wall thickness form added	KJ	



Packing I

Sales Order Nui

7

Sales Order

Aug 8,

LAB
1000 E. MERMAID LANE
WYNDMOOR, PA 19038

Voice: 215-233-2600
Fax: 215-233-5653

Sold To:
DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Ship To:
DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Customer ID	PO Number	Payment Terms
DARA	PO17601	Net 30 Days
Ship Via	Process	
R & L CARRIER		

Quantity	Item	Description	Total Shipped	This Shipment
1.00		1 PC. 86987 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00		1 PC. 86988 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00		1 PC. 84668 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		8/28-21

COMMENTS

SHIPPED BY, SIGNATURE
METLAB

DATE

RECEIVED BY, SIGNATURE
DART AEROSPACE

DATE

Sales Order
Aug 8,

LAB
1000 E. MERMAID LANE
WYNDMOOR, PA 19038

Voice: 215-233-2600
Fax: 215-233-5653

Sold To:
DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Ship To:
DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Customer ID	PO Number	Payment Terms
DARA	PO17601	Net 30 Days
Ship Via	Process	
R & L CARRIER		

Quantity	Item	Description	Total Shipped	This Shipment
1.00		1 PC. 84672 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00		1 PC. 84669 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00		1 PC. 84677 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT 180 POUNDS TOTAL		

COMMENTS

SHIPPED BY, SIGNATURE
METLAB

DATE

RECEIVED BY, SIGNATURE
DART AEROSPACE

DATE



1000 E. Mermaid La., Wyndmoor (Phila.) PA 19038-8093
Tel. (215) 233-2600 Fax (215) 233-5653

Invoice

Invoice Num.
0114
Invoice Da
Aug 16, 20

Sold To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Ship To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Customer ID		Customer PO	Payment Terms	
DARA		PO17601	Net 30 Days	
Shop Order No.		Shipping Method	Ship Date	Due Date
Quantity	Item	Description	Unit Price	Extensi
1		1 PC. 86987 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT	205.000	20
1		1 PC. 86988 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT	205.000	20
1		1 PC. 84668 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT	205.000	20
1		1 PC. 84672	205.000	20

ANY DISCREPANCIES MUST BE REPORTED WITHIN 10 DAYS AFTER RECEIPT.

We accept AMEX, Visa & Master Card



Heat Treating and Metallurgical Consulting

Subtotal
Shipping/Handling
Total Invoice Amount
Payment Received

TOTAL

Conti
Conti
Conti
Conti

Visit our Web Site: <www.thomasregister.com/metlab/>



1000 E. Mermaid La., Wyndmoor (Phila.) PA 19038-8093
Tel. (215) 233-2600 Fax (215) 233-5653

Invoice

Invoice Num

0114

Invoice D

Aug 16, 20

Sold To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Ship To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Customer ID	Customer PO	Payment Terms		
DARA	PO17601	Net 30 Days		
Shop Order No.	Shipping Method	Ship Date	Due Date	
73369	R & L CARRIER	8/16/12	9/15/12	
Quantity	Item	Description	Unit Price	Extensi
1		D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1	1 PC. 84669	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT	205.000	205.000
1	1 PC. 84677	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT 180 POUNDS TOTAL	205.000	205.000

ANY DISCREPANCIES MUST BE REPORTED WITHIN 10 DAYS AFTER RECEIPT.

We accept AMEX, Visa & Master Card



Heat Treating and Metallurgical Consulting

Subtotal	1,23
Shipping/Handling	
Total Invoice Amount	1,23
Payment Received	
TOTAL	1,23

Visit our Web Site: <www.thomasregister.com/metlab/>

North American Free Trade Agreement Certificate of Origin

Please print or type

1. Exporter's Name and Address: Metlab 1000 E. Mermaid Lane Wyndmoor, PA 19038		2. Blanket Period: (dd/mm/yyyy) From: 01/01/2012 To: 31/12/2012				
Tax Identification Number: 23-2973306						
3. Producer's Name and Address: Metlab 1000 E. Mermaid Lane Wyndmoor, PA 19038		4. Importer's Name and Address: Dart Aerospace 1270 Aberdeen Street Hawkesbury, ON K6A 1K7 CANADA				
Tax Identification Number: 23-2973306		Tax Identification Number:				
5. Description of Good(s)		6. HS Tariff Classification Number	7. Preference Criterion	8. Producer	9. Net Cost	10. Country of Origin
Heat Treatment Services		8483.401	C	Yes	No	USA
11. I CERTIFY THAT: <ul style="list-style-type: none"> * the information on this document is true and accurate and I assume the responsibility for proving such representations. I understand that I am liable for any false statements or material omissions made on or in connection with this document; * I agree to maintain, and present upon request, documentation necessary to support this Certificate, and to inform, in writing, all persons to whom the Certificate was given of any changes that would affect the accuracy or validity of this Certificate; * the goods originated in the territory of one or more of the Parties, and comply with the origin requirements specified for those goods in the North American Free Trade Agreement, and unless specifically exempted in Article 411 or Annex 401, there has been no further production or any other operation outside the territories of the Parties; and * this Certificate consists of <u>One (1)</u> page, including all attachments. 						
Authorized Signature: 			Company: Metlab			
Name: Mark Podob			Title: Vice President			
Date: (mm/dd/yyyy) 8/16/2012	Telephone: 215-233-2600			Fax: 215-233-5653		



1000 E. Mermaid Ln., Wyndmoor (Phila.) PA 19038-5093
Tel. (215) 233-2600 Fax (215) 233-5653

ORDER ACKNOWLEDGEMENT

613 632 1053

E-MAILED TO: _____ FAXED TO: _____

QF-4.7.2.2-01

Rev A 5/10/10

CUSTOMER:	PO NUMBER:
Dart Aerospace	P017601
DATE MATERIAL RECEIVED:	METLAB QUOTE NUMBER: <input checked="" type="checkbox"/> <input type="checkbox"/> Or, MINIMUM STD ORDER(CHECK)
ESTIMATED SHIP DATE:	METLAB S.O. NUMBER: 73369

THANK YOU FOR YOUR ORDER. WE WILL MAKE OUR BEST EFFORT TO SHIP YOUR ORDER ON OR BEFORE THE ESTIMATED SHIP DATE SHOWN ABOVE. IF YOU NEED TO CONTACT US REGARDING THIS ORDER, PLEASE REFERENCE THE METLAB S.O. NUMBER SHOWN ABOVE.

QUOTATION MISSING? OK TO PROCESS WITHOUT Dk

PURCHASE ORDER MISSING? OK TO START PROCESSING WITHOUT

NOTE THAT WE NEED THE FOLLOWING INFORMATION IN ORDER TO COMPLETE YOUR ORDER AND TO MEET THE PROMISED SHIP DATE:

TECHNICAL INFORMATION REQUIRED(LIST) : _____ ON HOLD : YES NO

OTHER INFORMATION OR CLARIFICATION: _____ ON HOLD: YES NO

RELEASED FOR PROCESSING BY: An DATE: 8/8/12

ACKNOWLEDGED BY:

TODAY'S DATE: _____

SHIPPED DATE: _____

THIS ORDER IS ACKNOWLEDGED WITH THE UNDERSTANDING THAT THE ABOVE PURCHASE ORDER IS IN ACCORDANCE WITH METLAB'S TERMS AND CONDITIONS OF SALE AS SUBMITTED AT THE TIME OF THE ABOVE QUOTATION.

Page 1 of 1

Process Owner: M. Podob
Management Representative: W. Miller

Approved by: J.G. Codybear



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID PO17601

Purchase Order Date 8/2/2012
PO Print Date 8/2/2012

Page Number 1 of 2

Order From : VU-MET001

METLAB
1000 E. MERMAID LANE
WYNDMOOR, PA 19038
USA

Contact Name	Buyer	Brigitte Golden
Vendor Phone	Requisition Nbr	
Vendor Fax	Tax Resale Nbr	10127-2607
Vendor Account Nbr	Terms	Net 30
	Currency	USD
	FOB	Destination-Collect

Ship To : DART AEROSPACE LTD 1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Line Nbr	Reference Revision ID	Description/ Mfg ID	Req Date/ Taxable	Req Qty/ Unit of Measure	Ship Method	Unit Price	Extended Price
	Vendor Part Number						
1	86987 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.0000
			Yes				
2	86988 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.0000
			Yes				
3	84668 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.0000
			Yes				

Special Inst: HEAT TREAT TO MIN 180 KSI
(MIL-T-6736 OR AMS 2759-1C)
SAND BALST TUBE AFTER HEAT
TREAT
CETIFICATIONS

Special Inst: SAME AS ABOVE

Special Inst: SAME AS ABOVE

No substitution or deviation without
consent.
Certificate of Conformity or Material
Certification required - YES NO

Change Nbr: 1

Change Date: 8/2/2012

Sp 12-8-2T





Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO17601**

Purchase Order Date 8/2/2012
PO Print Date 8/2/2012

Page Number 2 of 2

Order From : VU-MET001

METLAB
1000 E. MERMAID LANE
WYNDMOOR, PA 19038
USA

Contact Name	Buyer	Brigitte Golden
Vendor Phone	Requisition Nbr	
215-233-2600	Tax Resale Nbr	10127-2607
Vendor Fax	Terms	Net 30
215-233-5653	Currency	USD
Vendor Account Nbr	FOB	Destination-Collect

4	84672	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.0000
			Yes				

5	84669	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.0000
			Yes				

6	84677	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.0000
			Yes				

Special Inst: Same as above

PO Total: \$1,230.00

8/128-21

Change Nbr:	1	Change Date:	8/2/2012	No substitution or deviation without consent. Certificate of Conformity or Material Certification required - YES NO
-------------	---	--------------	----------	--

Brigitte Golden

From: Mark Podob <mpodob@metlabheatheat.com>
Sent: Thursday, August 02, 2012 10:15 AM
To: Doris Funches; Dan Krackovic; Eugene Roberts
Cc: Brigitte Golden
Subject: FW: New PO17601 from Dart
Attachments: D350-748-241-RevF.pdf; PO17601 Metlab.pdf

Importance: High

New P.O. from Dart.

Mark Podob
Vice President, Marketing and Sales
Metlab
1000 E. Mermaid Lane
Wyndmoor, PA 19038
215-233-2600 Ext. 232
(F) 215-233-5653
mpodob@metlabheatheat.com

*PICK UP
X
JBG a/w*

This message and any attachments are intended for the individual or entity named above. If you are not the intended recipient, please do not forward, copy, print, use or disclose this communication to others; also please notify the sender replying to this message and then delete it from your system.

From: Brigitte Golden [<mailto:bgolden@dartaero.com>]
Sent: Thursday, August 02, 2012 9:59 AM
To: Mark Podob
Cc: 'Linda Lacelle'
Subject: New PO17601 from Dart
Importance: High

Good Morning Mark!

Please find attached new PO for 6 crosstubes to be heat treated.

They are leaving today with Day & Ross this afternoon, tracking # OTT 19872092

Thank You

Brigitte Golden
Order Processing
DARTAEROSPACE Ltd.

1270 Aberdeen Street
Hawkesbury Ontario
Canada K6A 1K7
Tel:(613)632-5200 Ext 224
Fax:(613)632-1053

bgolden@dartaero.com



Please consider your environmental responsibility before printing this e-mail

From: Brigitte Golden [<mailto:bgolden@dartaero.com>]
Sent: Friday, July 27, 2012 11:19 AM
To: 'mpodob@metlabheatheat.com'
Cc: 'Linda Lacelle'
Subject: PO17555 from Dart

Please find attached the PO
Thank You

From: Linda Lacelle [<mailto:llacelle@dartaero.com>]
Sent: Thursday, July 26, 2012 2:36 PM
To: mpodob@metlabheatheat.com
Cc: Brigitte Golden
Subject: more tubes

Hi Mark,
We will be shipping out 9 tubes tomorrow for heat treat. Another batch should follow end of next week. As always, I need these asap..
Thx!

Linda Lacelle
Production manager
Dart Aerospace

**Commercial Invoice:145**

Ship From: Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Canada
Tel # 1.613.632.5200
GST # RT101272607

Ship To: METLAB
1000 E Mermaid LN
Wyndmoor
PA, 19038 US

ATTN: Mark Podob
PH# 215 233 2600

Date: 2-Aug-12 **P.O. #** 17555 **Broker:** UPS SCS
PH#: 800 443-6379

Ship Via: Day & Ross PPD **FOB:Origin**

Item	Part Number / Product Description	Tariff Class.	Quantity	Unit Price	Total
1	Crosstube D350-748-241	8803.20	6	\$ 1,250.00	\$ 7,500.00
2					
3					
4					

All Prices are in US Dollars

All of the above parts were made in Canada unless otherwise indicated
THIS IS A CUSTOMS INVOICE ONLY

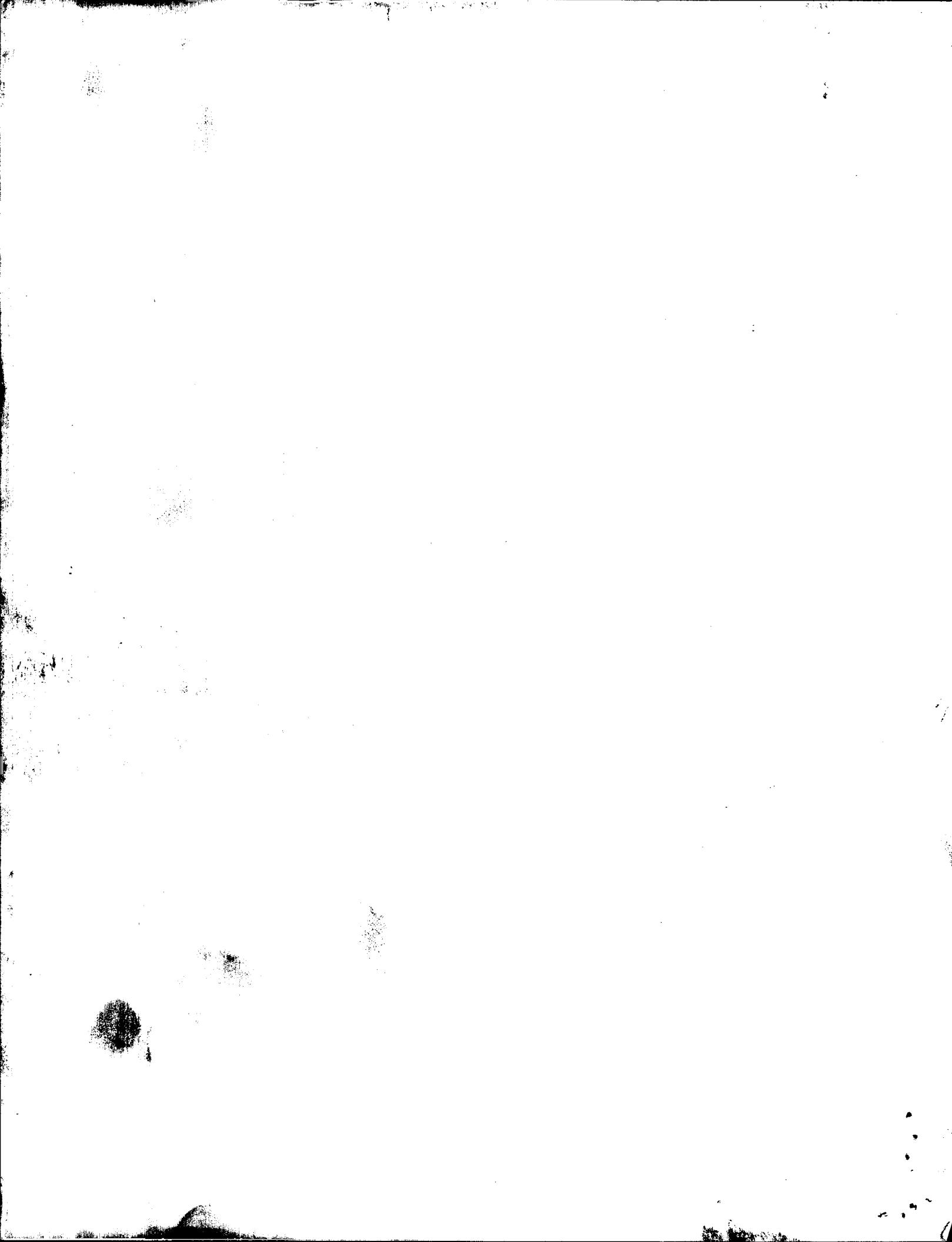
Sub Total \$7,500.00

Total \$7,500.00

Amount Due: \$7,500.00

Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Canada
Tel.: 1.613.632.5200
Fax: 1.613.632.1185
GST # RT101272607





D 350 X-TUBE CUFF MEASUREMENTS

AFTER HEAT TREATING

TYPE	BATCH #	SIDE A		SIDE B	
		TWO READINGS		TWO READINGS	
1 AFT	84672	2.251"	/2.235"	2.257"	/2.244"
2 AFT	84677	2.239"	/2.245"	2.239"	/2.251"
3 AFT	84669	2.238"	/2.244"	2.232"	/2.255"
4 AFT	84668	2.254"	/2.238"	2.256"	/2.240"
5 AFT	84675	2.248"	/2.238"	2.251"	/2.240"
6 AFT					
7 AFT					
8 AFT					
9 AFT					
10 AFT					
11					
12 FWD	84660	2.257"	/2.233"	2.253"	/2.228"
13 FWD					
14 FWD					
15 FWD					
16 FWD					
17 FWD					
18 FWD					
19 FWD					
20 FWD					
21 FWD					
22 FWD					
23 FWD					

